



## Short Communication

## COVID-19 pandemic: A pragmatic plan for ayurveda intervention

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## ABSTRACT

World community is facing an unprecedented pandemic of novel corona virus disease (COVID-19) caused by Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2). The disease has spread globally with more than 1.43 million confirmed cases and 82,100 deaths as of April 8, 2020. Despite worldwide efforts to contain it, the pandemic is continuing to spread for want of a clinically-proven prophylaxis and therapeutic strategy. The dimensions of pandemic require an urgent harnessing of all knowledge systems available globally. Utilization of Traditional Chinese Medicine in Wuhan to treat COVID-19 cases sets the example demonstrating that traditional health care can contribute to treatment of these patients successfully. Drawing on the Ayurveda classics, contemporary scientific studies, and experiential knowledge on similar clinical settings, here we propose a pragmatic plan for intervention in India. We provide a plan for graded response, depending on the stage of infection among individuals, in a population. Notwithstanding the fact that no system of medicine has any evidence-based treatment for COVID-19 as yet, clinical interventions are required to be put in place. Therefore, pragmatic strategy proposed here for Ayurveda system of medicine requires immediate implementation. It will facilitate learning, generate evidence and shall be a way forward.

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## 1. Background

An outbreak of pneumonia in December, 2019 in Wuhan, China, has now been determined to be caused by a novel coronavirus. It is named as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [1,2]. The disease has since spread to 185 countries and regions, with more than 2.06 million confirmed cases and more than 1,34,354 deaths as of April 16, 2020 [3]. Despite worldwide efforts to contain it, the pandemic is continuing to spread for want of a clinically-proven prophylaxis and therapeutic strategy [4]. Consequently, it is necessary that scientific community must draw on pluralistic knowledge systems available globally. Drawing on the original Ayurveda classics, contemporary scientific studies, and our experiential knowledge on similar clinical settings, here we propose a pragmatic plan for interventions. We provide a graded response depending on the stage of infection and proximity with

disease among individuals in a population. Notwithstanding the fact that no system of medicine has any evidence-based treatment for COVID-19 as yet, clinical interventions are being done worldwide. Similar strategy is required to be implemented by Ayurveda system of medicine. Ayurveda interventions become even more relevant by the fact that there is an elaborate description of causation and management of epidemic (*Janapadodhwamsa*) in Ayurveda [5].

While the disease is almost controlled in China [6], it is still widespread in Europe and US which have emerged as the new epicentres of the COVID-19 [7,8]. There are various reasons for the containment of the disease in China, yet the evidence of role played by Traditional Chinese Medicine (TCM) cannot be overlooked [9,10]. This is now known that during the peak days of the epidemic, over 3100 TCM related workforce had been deployed to Hubei province [9]. TCM was officially included in the Chinese Guideline on diagnosis and treatment of COVID-19 [11]. This is exceptionally important to note that specific TCM wards were set up, and designated hospital were established which had used a variety of Chinese medicines utilising their own principle of syndrome differentiation in conjunction with treatment employing western medicine. Total numbers of confirmed cases treated by TCM are reported to be at least 60,107 [12].

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In coherence with the success of TCM in managing a communicable pandemic, it is logical and essential to explore how Ayurveda can help in addressing the COVID-19 challenge [13,14]. Indeed, this is the time to mainstreaming the AYUSH systems to transform Indian healthcare [15] and demonstrate the potential of AYUSH systems in addressing the challenge and restoring health [16]. An understanding of COVID-19 epidemiology and pathogenesis as learned through on-going pandemic may help us drawing a feasible plan of action. About 80% of COVID-19 cases present with mild symptoms requiring only primary medical care. Of the rest 20% cases 15% require urgent medical attention at secondary health care services. Remaining 5% are critical cases requiring an intensive care and hence require a transfer to tertiary health care units equipped with ICU [17].

Current estimated mortality of COVID-19 for overall infected population is 0.25–3.0% whereas it increases to >14% among elderly (over 80 years), 10% in associated CVD and 7% in associated diabetes. China's experience of pandemic has built the evidences that co-morbidity such as hypertension, diabetes, coronary heart diseases and cerebrovascular disease act as risk factor with increased risk of mortality [18].

In 5% cases requiring Intensive care, the disease progression is gradual, and requires about 9–10 days to progress from symptoms of Upper Respiratory Tract Infection (URTI) to Acute Respiratory Distress Syndrome (ARDS). ARDS often is followed by uncorrectable hypotensive shock, multi-organ failure and eventually death [19].

There are some risk factors that make people susceptible. People with older age, presence of co-morbidities such as diabetes, hypertension and cardiovascular disease, males, anorexia and presentation without fever are more susceptible. Reduced peripheral capillary oxygen saturation (SpO<sub>2</sub>) below 90% is also a risk indicator in apparently mild cases [20].

With this background of SARS-CoV-2 associated epidemiology and pathogenesis, a pragmatic and plausible plan of action for Ayurvedic intervention are presented (Table 1). In this context, a few important issues need to be stated at the outset. Our proposal complements the guidelines issued by Ministry of AYUSH, Government of India for boosting immunity among the masses [21]. However, it is not limited to prophylaxis alone. It addresses the therapeutic domain as well although within an integrative model of care. In that context, at a generic level, key criteria for choosing suggested Ayurveda medicines here have been safety and potential efficacy, broad-spectrum applicability, ease of availability, long-term experiential knowledge on clinical use, ease of administration, and as far as possible, affordability [22].

For the purpose of Ayurveda interventions during COVID-19 pandemic, people can be segregated into four distinct categories [23].

## 2. Unexposed asymptomatic group

This group will include persons who currently do not have any related symptom nor have any associated risk factor and co-morbidities. These apparently healthy people may be the most suitable for building of immunity so that infection-related pathogenesis can be countered to keep them healthy [24]. Preventive interventions here can include both pharmacological as well as non-pharmacological strategies. Among the non-pharmacological interventions healthy lifestyles, adequate physical activity, sufficient sleep, care of retainable and non-retainable urges, *sadvritta*, and avoidance and isolation from infected persons are vital [25]. Fumigation of homes, shelters and living-place by Ayurvedic herbs such as garlic (*Allium sativum*) peel, turmeric (*Curcuma longa*) powder, Carom or Ajwain (*Trachyspermum ammi*) seeds and Loban (resin of *Styrax benzoin* and *Boswellia* species) may also be a useful strategy for disinfection [26]. In addition, community based *Swarna Prashana* [27] and mass prophylaxis through *rasayana* having the predominant effects upon respiratory tract can be useful [28]. *Rasayana* may include *Brahma Rasayana*, *Chyavanprasha* or *Amrit Bhallataka* [29,30]. The rationale for choice of *rasayana* drugs can be traced back to *Samhita* classics of Ayurveda as well as in contemporary research [14]. *Rasayana* act as antioxidant, anti-stress, anti-inflammatory, anti-microbial, vaccine adjuvant, and confer immunity against diseases [31,32]. Further, according to Ayurveda classics, *rasayana* therapy [33], along with physical and social distancing from infected persons [34], constitute a core strategy to overcome epidemic and infectious diseases. Building immunity requires time. There may be some asymptomatic carriers who could transmit the virus to other apparently healthy people. Hence, physical and social distancing for all would be essential to avoid any transmission [34].

## 3. Exposed asymptomatic (quarantined)

This group comprises of people who are without apparent symptoms, but at risk due to contact history. They need to be quarantined carefully. Specific prophylaxis for this group may include *Sanjeevani vati* [35] and *Chitrakadi vati* and combination of *Guduchi* (*Tinospora cordifolia*), *Shunthi* (*Zingiber officinale*) and *Haridra* (*C. longa*). This choice of medicines is aimed at maintenance of *agni* as well as *aam pachana* in order to prevent the progression of pathogenesis in its initial *sanchaya-prakopa-prasara* stage [36]. *Sanjivani vati* is widely used against communicable diseases, fever due to infection and *sannipataj jvara*, cold, cough, and indigestion. It

**Table 1**  
Proposed Ayurveda interventions in COVID-19 outbreak and their rationale<sup>a,b</sup>.

No.	Category of people	Proposed Intervention
1.	Unexposed asymptomatic group	Common health keeping approaches of Ayurveda including healthy diet, healthy life-style, adequate sleep, physical activity, good conduct, care for retainable and non-retainable urges, and avoidance of disease causing factors (excessive cold and exposure to pollutants). In addition, <i>Chyavanprasha</i> , <i>Brahma Rasayana</i> , <i>Amrit Bhallataka</i> , <i>Sanjeevani vati</i> , <i>Swarna prashan</i> .
2.	Exposed asymptomatic (Quarantined)	<i>Sanjeevani vati</i> , <i>Chitrakatdi vati</i> , <i>Chyavanprasha</i> , <i>Brahma Rasayana</i> , and decoction of a combination of herbs, <i>Tinospora cordifolia</i> , <i>Zingiber officinale</i> , <i>Curcuma longa</i> , <i>Ocimum sanctum</i> , <i>Glycyrrhiza glabra</i> , <i>Adhatoda vasica</i> , <i>Andrographis paniculata</i> , <i>Swertia chirata</i> , <i>Moringa oleifera</i> , <i>Triphala</i> and <i>Trikatu</i> .
3.	With mild COVID-19 symptoms	<i>Pippali rasayan</i> , <i>Go Jihvadi Quath</i> , <i>Kantakari Avaleha</i> , <i>Chitrakadi vati</i> , <i>Vyaghri haritaki</i> , <i>Dashamul kwath</i> , <i>Sitopaladi</i> , <i>Talishadi</i> , and <i>Yashtimadhu</i> etc.
4.	With moderate to severe COVID-19 symptoms	<i>Pippali rasayan</i> , <i>Laghu Vasant Malati</i> , <i>Sanjeevani vati</i> , <i>Tribhuvan Keerti rasa</i> , <i>Brihata Vata Chintamni rasa</i> , <i>Mrityunjaya rasa</i> , <i>Siddha Makardhvaja</i> etc.

<sup>a</sup> **Note:** The proposed interventions are supposed to be practiced without compromising the conventional advisories by government authorities including frequent hand-washing with soap till 20 s, cough and sneeze etiquette, physical distancing and universal mask usage.

<sup>b</sup> Dosage of individual formulations are to be judged carefully by an experienced Ayurvedic physician on the basis of *roga* and *rogi bala* with an utmost care for vulnerable population like children, pregnancy and elderly. In almost all cases hot water may be considered as preferred *anupan* (post drink) during the treatment.

also strengthens and rejuvenates the immune system [37,38]. This group may also be provided with decoction of a combination of Ayurvedic herbs including *T. cordifolia*, *Z. officinale*, *C. longa*, *Ocimum sanctum*, *Glycyrrhiza glabra*, *Adhatoda vasica*, *Andrographis paniculata*, *Swertia chirata*, *Moringa oleifera*, Triphala and Trikatu. These herbs are proposed for the reason that these are known to be broad-spectrum antivirals and protease inhibitors [39–41].

#### 4. With mild COVID-19 symptoms

This category relates to people found positive to SARS-CoV-2 and are having mild URTI symptoms. They are required to be carefully isolated and monitored for any progression of the disease, along with giving adequate therapy to arrest the symptoms and balancing the vitiated *doshas* to control disease progression. Formulations like *Lakshmi Vilas Rasa* [42], *Pippali rasayana* [43], *Sanjeevani vati* [35], *C. vati*, *Go jihvaadi Kashaya*, *Vyaghri haritaki*, *Kantakaari Avaleha*, *Dashamul kwath*, *Sitopaladi* [44], *Talishadi*, and *Yashtimadhu* may be the most suitable drugs to be used at this stage in an integrative model. Those patients showing progression of the disease may immediately require shifting to ICU.

#### 5. With moderate to severe COVID-19 symptoms

This category may be the population where the moderate to severe symptoms are already present and the patients also belong to high risk groups. These patients require tertiary care from the beginning itself but can also be co-prescribed with Ayurveda medicines in order to reduce the impact of the pathology and to buy more time to have intensive management [45]. Recommended formulations here may include *P. rasayana* [43], *Laghu Vasant Malati*, *Sanjeevani vati*, *Tribhuvan keerti rasa* [46], *Brihata Vata Chintamni rasa*, *Mrityunjaya rasa*, and *Siddha makardhvaja rasa*. The key criterion for choosing *rasa aushadhi* in category 3 and 4 as noted above is the urgency of initiation of therapeutic actions. *Rasaushadhi* are shown to have better bioavailability and absorption through sublingual and oral route accounting to the nano size of their particles [47]. For example, *suvarna bhasma* has been found to get absorbed well through sublingual administration when mixed with black pepper powder and ghee [48].

Along with the above plan, Ayurveda practitioners would require training in screening of the people for associated risk factors. They should also be equipped with modern personal protection equipment and access to diagnostic facilities. Ayurveda hospitals may also be turned as the primary care setups and quarantine for the people having mild symptoms and requiring a constant monitoring. A good networking of AYUSH healthcare authorities with local health authorities may help effective utilisation of human resources in AYUSH community during the current crisis [49].

It is also important to mention a caveat here. Ayurveda doctors following the pragmatic action plan presented here should assess the prognosis and advise timely referrals to secondary or tertiary care facilities as per the need of patient. An extra and utmost care should be taken while treating COVID-19 patients/people suspected to have contracted infection of SARS-CoV-2.

This action plan, if implemented, has enormous potentials to provide learning and innovative insights. Thus, a proper documentation is crucial. Therefore, it is suggested that a proper documentation of key variables that are essential should be done on each case. These variables should include age, gender, symptoms, geography, contact history, Ayurvedic diagnosis including a *roga* and *rogi bala* examination, improvement or worsening of symptoms, Ayurvedic medicine(s) with dosage, final outcome of the management, referral to secondary/tertiary care, symptoms

controlled, cured, and mortality, if any. A follow-up advice upon discharge or stop of medications should also be documented.

TCM has been employed in COVID-19 cases not for their proven effectiveness against the pathogen but rather by utilising the Chinese traditional diagnostic concept identifying the syndromes and suggesting their remedies. Similar approach is also needed to be employed in Ayurveda. Accordingly, instead of employing a western approach alone for judging the efficacy of a formulation on a western diagnosis, Ayurveda should follow its own wisdom for diagnosis and subsequent treatment choice on the basis of *roga* and *rogi bala*, as described above.

There are 3598 AYUSH hospitals available in the country including 2818 Ayurveda hospitals. Similarly, there are 25,723 AYUSH dispensaries including 15,291 Ayurveda dispensaries. There are total 7.73 lakh registered AYUSH practitioners including 4.28 lakh Ayurveda practitioners [50]. There are 8954 AYUSH drug manufacturing units (licensed pharmacies) in the country. Among these, 7718 are Ayurveda pharmacies [51]. With this infrastructure and associated human resources, implementation of the proposed action plan seems highly feasible.

#### 6. Recommendations and the way forward

Ayurveda has enough potential and possibilities to be employed both for prevention and treatment of COVID-19. This will provide an important opportunity for learning and generating credible evidence [52]. It is pertinent to reiterate that participation of Ayurveda in addressing the COVID-19 challenge in India should not remain limited and seen as the extension of healthcare services and support to bio-medical system. Indeed, with adequate monitoring and data keeping during the implementation, important lessons and research directions are likely to emerge on the management of increasingly frequent and virulent communicable diseases. Implementation of proposed action is likely to provide evidence-based insights strengthening the scope of Ayurveda beyond preventive health care and care for non-communicable diseases. AYUSH system across the country has been put on alert for being called anytime to serve the nation. AYUSH healthcare facilities are also being readied to be converted into quarantine facilities in times of need. From this perspective, implementing the suggested intervention plan within AYUSH healthcare facilities by Ayurveda workforce may benefit the nation greatly. India is the country where the world's oldest living health care system originated and therefore it is being carefully watched by the world community for how it handles the crisis using its own resources. China has done it. And it is India's turn now to show its traditional healthcare might.

#### Conflict of interest

None.

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